

PATENT – Docket Number: 06316D2 USA

RemarksClaim Rejections - 35 USC §102(B) - Novelty

In the Office Action, the Examiner rejected Claims 1, 3, 5 and 7 under 35 USC 102(b) as being anticipated by Cheung '006 (US-4,574,006).

Cheung '006 teaches a process which produces a krypton-xenon concentrate for a liquid feed while also producing a liquid product substantially free of rare gases. In particular, Cheung '006 teaches the use of a distillation column to effect the separation of krypton-xenon. Cheung '006 does not teach or suggest the use of a dephlegmator to effect the separation of krypton-xenon. Since both independent Claims 1 and 5 require that the separation is effected by a dephlegmator, Cheung '006 cannot anticipate Claims 1 and 5 or any other claim dependent thereon.

Claim Rejections - 35 USC §103 - Obviousness

In the Office Action, the Examiner rejected Claims 2 and 6 as being unpatentable over Cheung '006 in view of Dennis (US-3,191,393)

As mentioned above, Cheung '006 does not teach or suggest the use of a dephlegmator to effect the separation of krypton-xenon (rare gas recovery system).

Further, Cheung '006 teaches feeding pressurized LIQUID oxygen to the rare gas recovery system as opposed to the present invention in which the feed has already been substantially vaporized prior to being fed to the rare gas recovery system. In Cheung '006, reboiler 37 is clearly part of the rare gas recovery system and is comparable to, for example, reboiler 18 in Fig 1A of the subject application. In Fig 1A of the subject application, the feed 108 has been vaporised external to the rare gas recovery system and therefore allows the reboiler 18 to be much smaller than would be the case for the Cheung '006 patent.

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In the Office Action, the Examiner states that column 1, lines 28-35 of Cheung '006 teaches that oxygen has 5 times Kr/Xe concentration of air. The oxygen stream referred to in this section of Cheung '006 is NOT the feed to the rare gas recovery system but instead to the bulk of the LOX descending the LP column. Column 3, lines 57-62 of Cheung '006 show that Kr/Xe feed must be about 10 times that in feed air. While Applicants are not sure what point the Examiner was making, it appears that the Examiner was misunderstood the teaching of Cheung '006.

In the Office Action, the Examiner alleges that Cheung '006 teaches the inventive concept of the present invention relating to the use of a heat exchanger to derive Kr/Xe from a vaporized LOX stream. However there are two main differences between the present invention as claimed and the teaching of Cheung '006. As explained above, Cheung '006 does not teach feeding the rare gas recovery system with a substantially vapor stream. Further, the heat exchanger taught in Cheung '006 is not a dephlegmator which allows simultaneous heat and mass transfer. Instead, as explained above, Cheung '006 teaches the use of a distillation column for mass transfer and a heat exchanger for heat exchange.

Finally, although Figure 3 of Dennis teaches the use of a vapor feed into rare gas recovery column 122 (i.e., the liquid oxygen stream was first vaporized in exchanger 120), the rare gas recovery system is NOT a dephlegmator. The Examiner should also note that column 7, lines 32-35 of Dennis indicates that the feed gas has a Kr/Xe concentration of 1-5% which would mean that the feed to the Kr/Xe recovery system is more than 10,000 times the Kr/Xe concentration of feed air.

Therefore, there is no suggestion in either Cheung '006 or Dennis that would prompt the skilled man to consider using a dephlegmator to effect the separation in the rare gas separation system. Accordingly, the present invention as defined by the claims is not obvious in light of Cheung '006 or Dennis, when considered alone or in combination.

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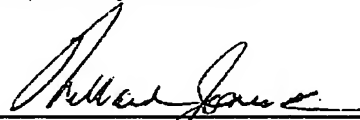
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Conclusion

In view of the foregoing remarks, Applicants respectfully submit that the claims are now in condition for allowance. Further examination, and reconsideration and withdrawal of all outstanding rejections, is respectfully requested, and the Examiner is encouraged to issue a formal Notification of Allowance.

Respectfully submitted,



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